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VOLUME XXVI DECEMBER, 1927 NUMBER 9

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THE JOURNAL OF GEOGRAPHY

A MAGAZINE FOR SCHOOLS

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VOLUME XXVI DECEMBER, 1927 NUMBER 9

THE SHEEP AND WOOL INDUSTRY OF AUSTRALIA

E. PYE

Petersham Boys' High School, Sydney, Australia

The sheep and wool industry of Australia is of especial interest to the geographer and to the Australian in that it is the staple industry of the continent, and is the outpost to our arid interior. Wide expanses of a continent noted for its poor rainfall have proved ideal for the development of the industry. It has been the object of the sheep-breeder in Australia, almost from the first, to produce not only a sheep with a high quality fleece, but one able also to withstand the climatic extremes and the semiarid conditions which prevail in so much of inland Australia. By this means it has been possible to extend the sheep belt closer to the arid region than would otherwise be the case. This together with the similar inland extension of the wheat belt as the result of improved drought-resisting grain and dry-farming methods are Australian examples of how man, in some degrees at any rate, has been able to modify his environment. And yet again, when we study the distribution of sheep in Australia in its relation to those natural factors which control it, we will realize how man is still bound for the great part by those factors. Altho he is no longer the plaything of Nature he has by no means completely conquered her. "Civilization has lengthened his leash and padded his collar, so that it does not gall; but the leash is never slipped."[1]

SHEEP DISTRIBUTION

The factors controlling sheep distribution in Australia are almost wholly climatic, and of the climatic factors rainfall is the most important. In Fig. 1 is shown the distribution of sheep correlated with the annual rainfall. From this map we can see that the

[1] E. Semple. Influences of Geographic Environment. Henry Holt & Co., New York

chief areas are to be found where the rainfall is from 15 to 25 inches annually. Where the annual rainfall is more than 30 inches, sheep—particularly merinos—are liable to foot-rot and other diseases. Only in Victoria, and the island state of Tasmania are they found in large numbers in these well-watered regions. Again despite the extension of the sheep runs into semiarid parts, as previously mentioned, it still remains true that when the rainfall

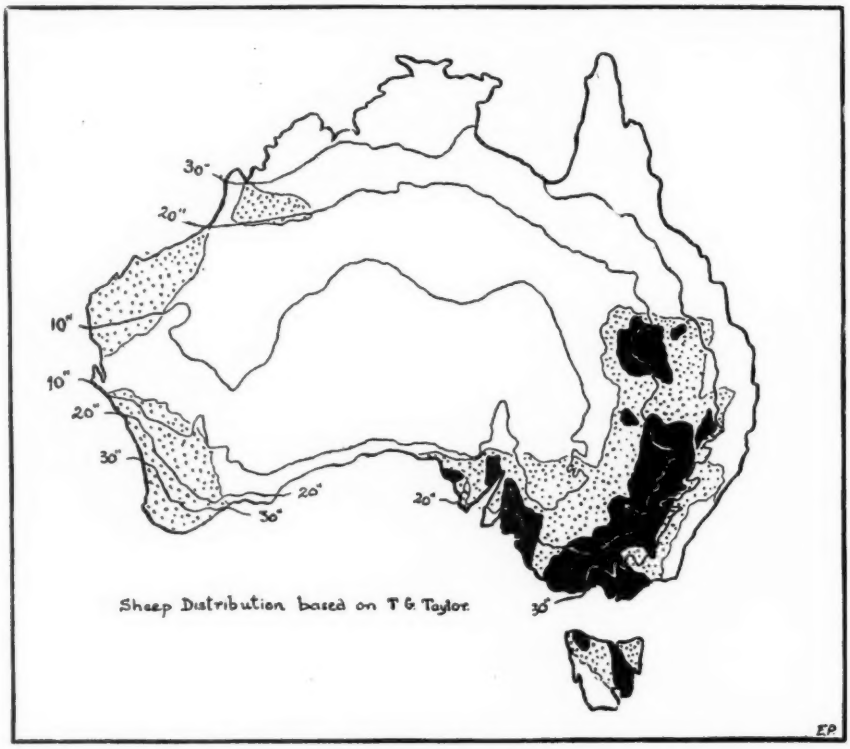

FIG. 1. Sheep distribution and rainfall controls. Black areas have over 100 sheep per square mile and dotted areas over 10. The 10, 20, and 30 inch annual isohyet lines are shown.

is very low herbage is too scanty for successful sheep-raising. The saltbush and bluebush of these regions are valuable for stock but compare badly with grasses in that they take a long while to recover if too closely cropped. Hence they are but thinly stocked as compared with the more favored regions of suitable rainfall and good grasslands. The sheep with its heavy fleece thrives better in the temperate than in the torrid zone and in this way temperature is a controlling factor of sheep distribution also.

With regard to future extension of the sheep areas, we may expect an increase in the numbers in the south west of West Australia, which is of a similar climatic and geographic type to the best sheep country in the eastern states. Numbers will probably increase also in a lesser degree in the tropical grasslands of

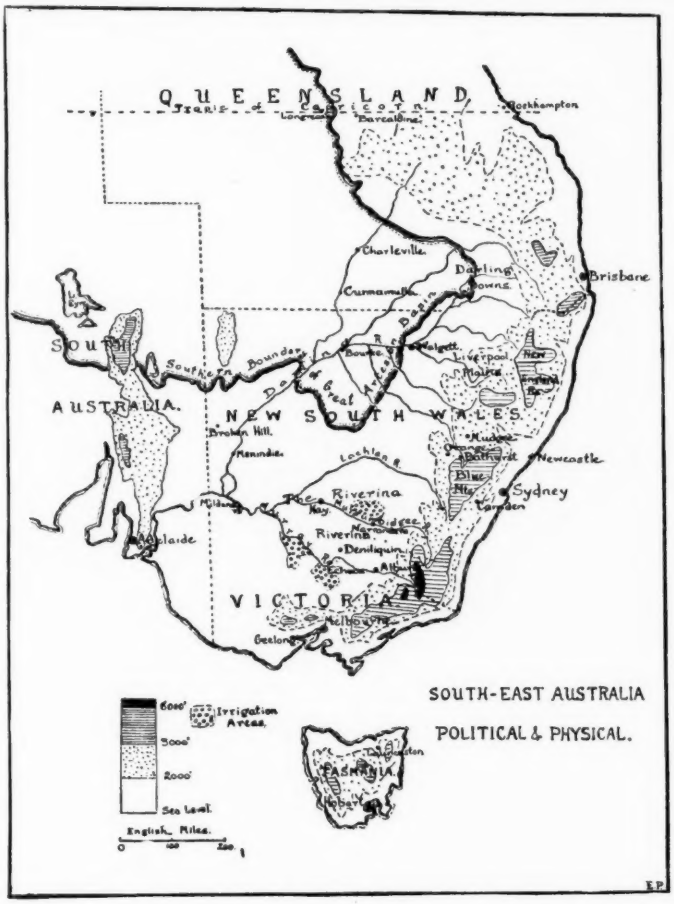

FIG. 2. Physical and political map of southeastern Australia

western Queensland, and in parts of Northern Territory and West Australia. Improved transport facilities should do much for the pastoral industry in these regions. This part of the continent has a moderate monsoonal rain in summer, and a winter drought, but despite this last fact much of it is very fair pastoral country. The Great Artesian Basin also provides drinking water for the sheep at all seasons.

To offset these extensions it is certain that some areas now devoted to sheep rearing will be given over to irrigation. Particularly is this likely in the Murray and Murrumbidgee valleys, and has actually eventuated where the Yanco Irrigation Area has taken the place of former valuable sheep country.

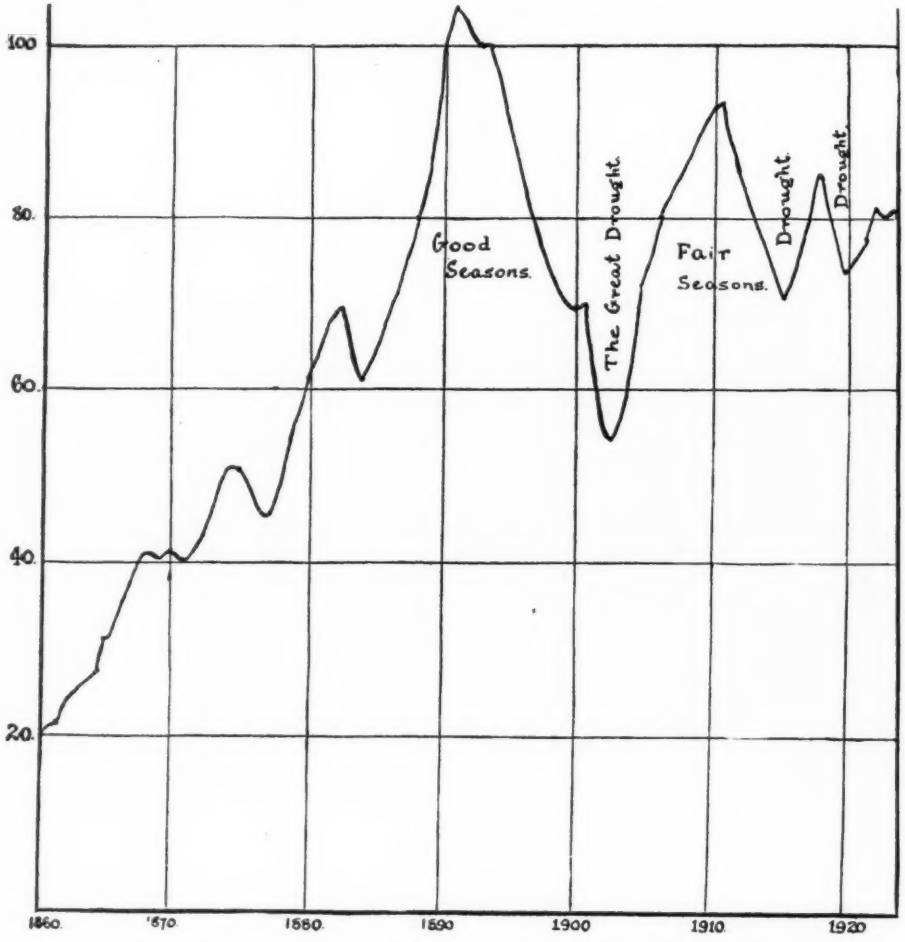

FIG. 3. Graf showing number of sheep in Australia from 1860 to 1924. Figures are in millions of sheep.

AUSTRALIAN SHEEP HISTORY

Altho a few fat-tail sheep were introduced into this country from Cape Colony in the first year of white occupation (1788), and likewise a few very poor quality sheep a few years later from India, it was not until Spanish Merinos were brought from South

Africa in 1797 that a real foundation of the present industry was laid. Captain Macarthur was the first to realize the possibilities of Australia for successful sheep raising. As a result in 1805 he visited England and obtained some of the best of King George's own flock. With these and the merinos from South Africa as a nucleus he, and other pioneers, commenced the task of building up the industry.

For some thirty years Camden on the eastern slopes of the Great Dividing Range was the chief center but it was then found

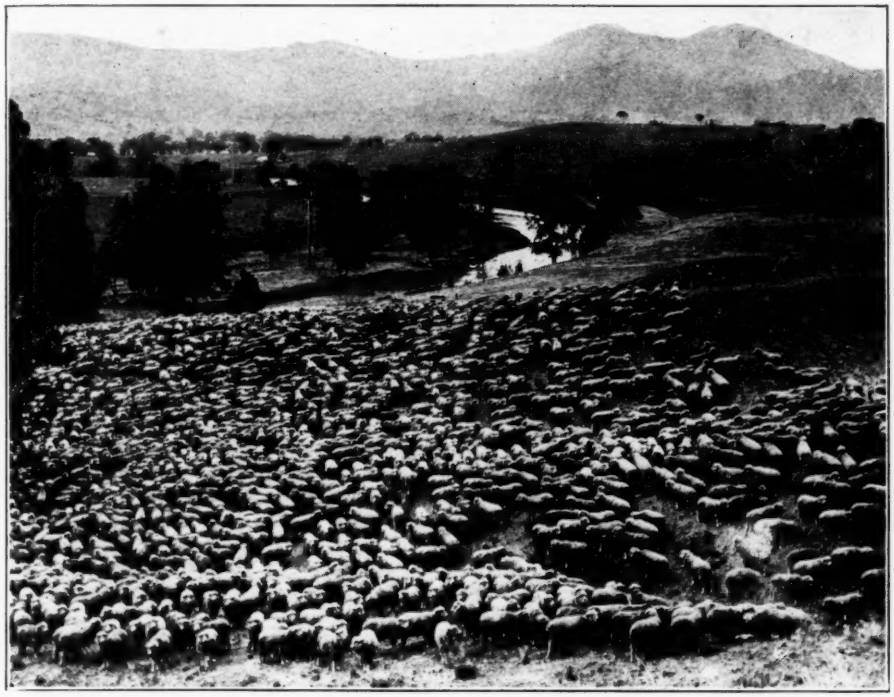

FIG. 4. Mustering sheep on a New South Wales station. Photo courtesy Commonwealth Immigration Office

that both sheep and pastures tended to deteriorate in this area. The fine natural pastures of the western slopes were then exploited and proved so satisfactory that in the early thirties of the last century, sheep owners were grazing their flocks on the grassland of this region from the Darling Downs in the north to the Murray river in the south.

Until almost 1870 Mudgee was the chief center, but during the great boom in sheep during the latter part of the nineteenth

century, the Riverina district, with centers at Hay, Narrandera, and Deniliquin, forged ahead and probably now occupies pride of place among the wool-producing districts of Australia. The Riverina is a name so famous in Australian sheep history that it is worthy of special note. It is an area of almost level plain country in the southwest of New South Wales drained by the

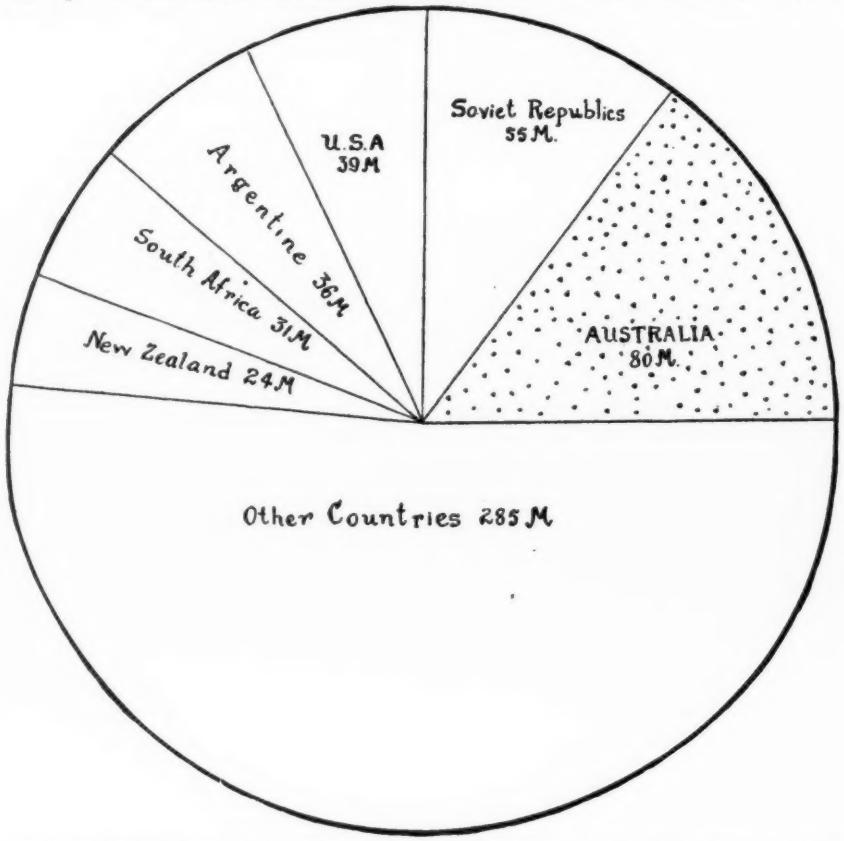

FIG. 5. Diagram showing the number of sheep in the leading sheep producing countries of the world. The estimates are those published in the Yearbook of the International Institute of Agriculture. The figures as given are not all for the same year. For example, those for Argentina are for 1922, for United States 1924, and for South Africa 1921. However, the diagram gives a fairly accurate idea of the relative importance of the various countries.

Murrumbidgee river with its tributaries, and the Murray with its northern tributaries. Its soil is rich, consisting for the most part of alluvium deposited by the rivers, and this, combined with a suitable rainfall, has resulted in an area particularly suited to the growing of merino wool.

Soon after the discovery of good pastures south of the Murray in 1836, sheep squatters began to cross that river and to establish runs in Victoria. Here also conditions were very favorable for the breeding of a high quality, fine-wooled sheep. The industry was a little later introduced into Queensland and South Australia with satisfactory results. The chief centers in the former state at the present time are Barcaldine, and Longreach, both on the tropic of Capricorn.

The graf (Fig. 3) shows the number of sheep in Australia from 1860 until 1924. Since 1924 the numbers have increased, and the official figures for 1925 which became available recently, give the

FIG. 6. Prize merino rams

total as 93,154,953. It will be seen that the number reached its maximum in 1891 when it exceeded 106 million, but a succession of poor seasons culminating in "the great drought" of 1902 resulted in tremendous losses. It is doubtful if the 1891 figures will be again reached as the sheep runs at that time were undoubtedly overstocked. Even the very probable opening-up of new country, the Queensland and West Australia, is unlikely to bring such a result as the growth of the frozen mutton industry is likely to prevent the numbers from unduly increasing.

The industry has not only shown marked improvement—despite its fluctuations—in sheep numbers, but also in the quality and quantity of the fleece, and in the physique of the sheep itself. The fleeces of Macarthur's sheep weighed about 3½ lbs. The average weight of wool from each sheep thruout the Commonwealth in 1924

was 6.86 lbs, whilst prize fleeces weigh from 30 to 40 lbs. This improvement is the result of careful breeding, suitable climatic conditions, and the adherence to wool breeds in preference to other breeds of sheep.

SHEEP IN AUSTRALIA TODAY

Breeds and Breeding. The merino has always been the predominant breed in Australia. Two chief factors can be advanced

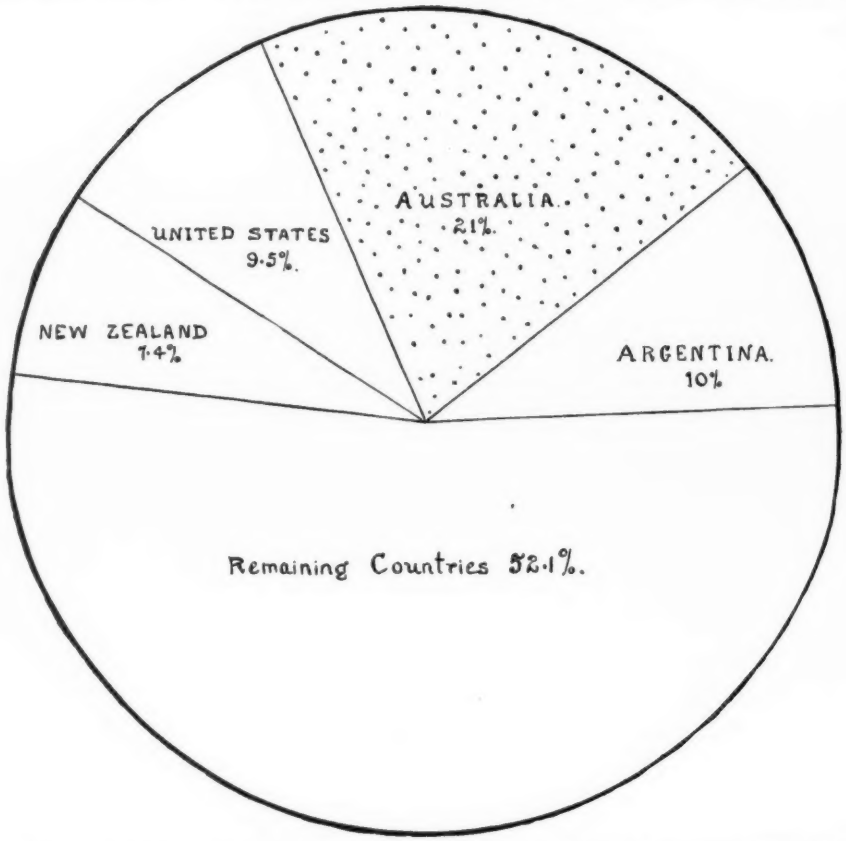

FIG. 7. Diagram illustrating the relative contribution of the four leading wool countries to the world's supply in 1925. Data compiled by U. S. Dept. of Com.

in explanation of this preeminence of the merino. Firstly, it is a hardy breed, the best able of all breeds of sheep to thrive in a region of comparatively poor rainfall. Next, it is the best sheep for wool purposes, and wool is more easily transported the long distances necessary to Australia's chief markets than the mutton

of mutton breeds. There are other breeds in Australia, but they are relatively unimportant.

The merino has many sub-types and the existence of these various merino types is due in the main to the effort of the sheep-breeder to obtain a type suited to the particular environment in which his flock is grazed. On the far-flung plains of the interior, where there are extremes of cold and heat and frequent droughts, we find a large framed merino with a broad-fibred wool. In cooler regions such as the highlands of New South Wales, and the western plains of Victoria, the merino is smaller of frame, and carries a fleece of very fine, dense wool.

FIG. 8. Scene in an Australian sheep shearing shed where modern methods are in use. Photo courtesy Commonwealth Immigration Office

Each year a stud sheep show, and prize sheep sales are held in the chief cities. Many of these prize sheep are bought by Australian sheep owners for flock improvement, but sheep-men from Argentina, Japan, and South Africa, among outside countries have for a number of years been heavy buyers of Australian stud sheep. As much as 5,000 guineas has been paid for one prize ram, while prices of 1,000 guineas and over are common. What has been claimed as easily the biggest merino stud flock in the world is the Boonoke station flock in the Riverina with 80,000 stud sheep (1926).

Pastures and Feeding. We have at present no artificial pastures similar to the alfalfa pastures of Argentina, altho we are well provided with natural grasses. Good use, however, is made of licks as an aid to nutrition.

The conservation of fodder, in the form of ensilage, lucerne, and oaten and wheaten hay, would be of great value to tide over times of drought, but Australia has not yet provided adequately in this respect. It was not until the recent drought in Queensland, which was broken only so recently as December, 1926, that any attempt had been made at wholesale artificial feeding. During that drought many thousands of sheep were saved by means of fodder brought from the coastal districts.

Sheep Transport. Sheep are not moved from winter to summer pastures as is frequently the case in United States, and certain

FIG. 9. Sorting wool in a sheep shearing shed. Photo courtesy Commonwealth Immigration Office

European countries, but during dry periods are sometimes transferred to areas where the drought has been less severely felt. Sometimes, the sheep are transported by rail but if no railway exists in that particular district it has been the custom to drive them on foot. If any distance has to be covered this is sometimes an impossible task, as the sheep are usually at such a time unfit for heavy travelling. For this reason it is interesting to note the success of a venture in southern Queensland during the recent drought.

Altho the motor lorry has been used in several parts of Austra-

lia for the transport of small numbers of sheep over short distances, it was not until this last drought in the northern state that any sheep owner had attempted to save his sheep by means of motor trucks, especially designed for sheep transport. On this occasion a flock of 10,000 sheep were conveyed from a part of the devastated area northwest of Charlesville to good pastures close to Cunnamulla—a distance of 200 miles. Two trucks were used for this work, each having four floors, and accommodating 240 sheep. Altho it took almost two months to transport the whole flock there were very few losses, the owner was spared the probable loss of

FIG. 10. Transporting wool to railway station by bullock-drawn wagons. Horses and the motor lorry are also used. The photograph shows typical pastoral country on the central western slopes of the Eastern Highlands of New South Wales. Photo courtesy Commonwealth Immigration Office

the great majority of his sheep, and expenses were not so heavy as those of hand-feeding would have been.

The Rabbit and Other Pests. Drought, fire, noxious weeds, and insect pests (blowfly, grasshopper, ticks, worms, etc.) are all hindrances in Australia to pastoral and agricultural development, but a greater menace than any of these—with the possible exception of drought—is the rabbit.

Where the rabbit fails to remove the pastures altogether, he eats the "heart out of them" by leaving only the poorer grasses and noxious weeds. When he has finished with the grass he will attack small trees, and "nibble the bark of the edible shrubs and saltbush. The black and withered shrubs look as if a bush fire had

swept over them. In these regions the writer has seen dead rabbits hanging in forked branches into which they have slipped, having actually climbed small trees to get at the green leaves.'"[2]

Despite varied, and numerous methods of destruction, rabbits up to the present show no signs of decreasing in numbers. As just one evidence of their great numbers we have the fact that for several months during 1922 close on 2,000,000 rabbit skins were sold weekly in the Sydney market alone. Among the methods of destruction, which have been used with varying success, are destruction of harbour, trapping, poisoning, shooting, driving, and various types of fumigation. Good use also has been made of

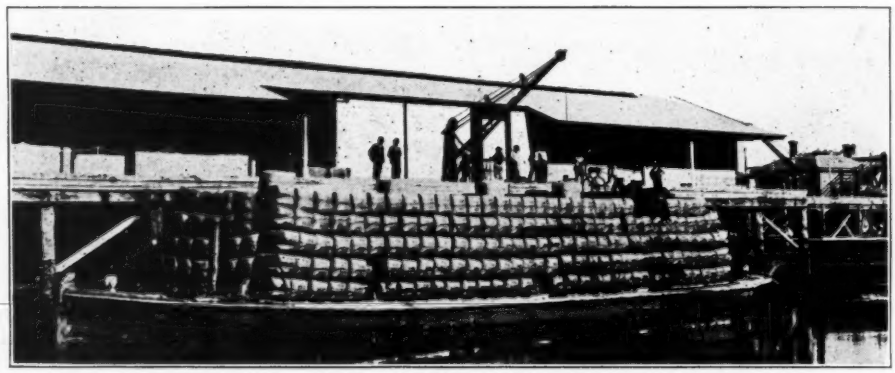

FIG. 11. A wool barge on the Murray River at Euchuca, Victoria. Photo courtesy Commonwealth Immigration Office

rabbit-proof fences in preventing the spread of the rodent. One of these fences in West Australia is 750 miles in length. Mr. D. G. Sead, who was appointed "Rabbit Menace Inquiry Commissioner" by the New South Wales government in April, 1925, states in his report that whilst he does not recommend any one method for universal use, he considers that the most effective method of extermination is fumigation with Cyanagos calcium cyanide.

Another pest present in Queensland and in the northwest of New South Wales is the dingo, but he has not assumed anything like the serious proportions of the rabbit menace.

WOOL

Shearing. Shearing, except in the smaller holdings, is done by machine. The time of shearing varies with the climate. In north-

[2] Prof. T. G. Taylor, Australia—Physiographic and Economic. Oxford University Press, London. 4th Ed., 1925

west Queensland, in the Australian "sudan," shearing begins in May, and sometimes even in April. As we move south into cooler latitudes, or into the highlands we find shearing in progress at a continually later period. In Tasmania shearing is done late in December and even into January and February.

Wool Transport. After the shearing the wool is first sorted, after which it is pressed into bales by wool presses, and finally hoop iron is fastened round the bales.

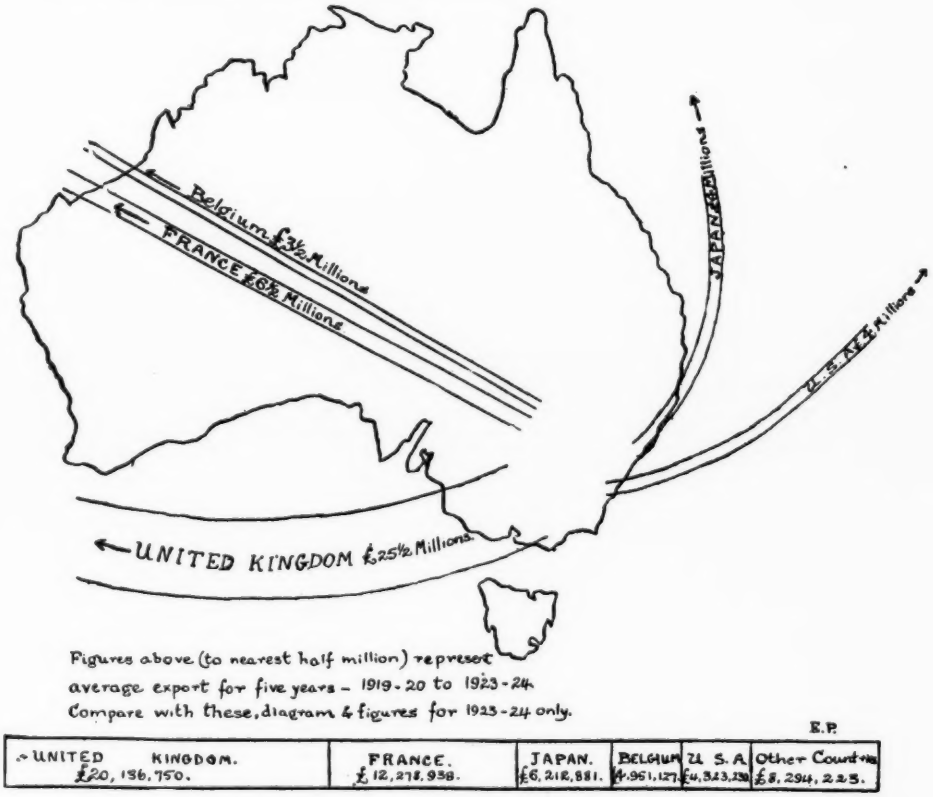
Belgium £3½ Millions
FRANCE £6½ Millions
JAPAN £2½ Millions
U.S.A. £4½ Millions
UNITED KINGDOM £25½ Millions
Figures above (to nearest half million) represent average export for five years – 1919-20 to 1923-24
Compare with these, diagram & figures for 1923-24 only.
E.P.
UNITED KINGDOM. £20,136,750.
FRANCE. £12,278,938.
JAPAN. £6,218,881.
BELGIUM £4,961,127.
U. S. A. £4,323,239
Other Countries £8,294,225.

FIG. 12. A map-diagram showing wool exports from Australia

From the sheep stations the wool is taken by various agencies to the railway, where it is transported to a convenient selling center. In the far west camels still do much of this work. Some of these animals are capable of carrying four bales—almost 1,400 pounds weight. The majority, however, carry two bales each.

Both bullock and horse teams are in great demand in the central west, whilst river barges ply on the navigable sections of the Murray, Darling, and Murrumbidgee, and convey the wool to the

nearest river port. From this port it can in turn be transported by rail to the selling center. The usual limit of navigation is Echuca on the Murray, Menindie on the Darling, and Hay on the Murrumbidgee, but during good seasons the river steamers can go as far as Albury, Walgett, and Narrandera. The weirs and locks, and storage reservoirs now in course of construction will greatly improve the navigable qualities of these two rivers, and they will consequently be more frequently utilized for wool transport. There will eventually be twenty-six weirs and locks on the Murray,

FIG. 13. Mutton sheep at Flemington salesyards, Sydney. Note the sheep dog resting on the backs of the sheep.

and nine on the Murrumbidgee. The Hume reservoir, just above Albury, which is being built primarily for the irrigation of the Murray valley and for the regulation of floods, will be used in addition to keep the locks provided with an adequate water supply, and will thus assist navigation. The dam and reservoir here are being constructed so that they will be capable of impounding 2,000,000 acre feet. In those parts of the wool belt closest to the coast, where the population density is greater, holdings smaller, and roads better, the motor lorry is now the chief agency for the conveyance of the wool to the railway station.

Wool Selling. About 86 per cent of the wool for overseas is now sold at local centers. All the state capitals, and Launceston and Geelong are important selling centers. The world's buyers attend these towns during the selling season. The wool itself is displayed in large, well-lit rooms, and the buyers frequently commence their inspections at an early hour in the morning. Then later in the day, when the sales begin, the auctioneer "very seldom has to ask for a bid. Usually as soon as he mentions the catalog number of the lot being offered, the buyers fairly shriek and yell at him the price they are willing to pay, everyone in a not unmusical choir trying to yell his bid louder than the other."[3]

Wool Exports The accompanying diagram (Fig. 13) shows the relative importance of Australia's wool export trade to various countries during the five years 1919-20 to 1923-24. France, since the war has been steadily gaining ground as a buyer of our wool, whilst Germany (a leading pre-war buyer) came well towards the front again during the 1925-26 season. Official figures for the 1925-26 season have not, at the time of writing, been made available.

Local Treatment and Manufacture of Woolen Goods. The manufacture of woolen textiles in Australia is of comparatively recent growth, but the industry has made great progress. In 1914 there were 22 mills in the Commonwealth. In 1925 this number had reached 51, with more in course of erection. Top-making and Carbonizing also are both becoming important industries.

MUTTON

Altho of much less importance than wool, mutton has of recent years become an important product, and large consignments of frozen mutton and lamb are exported to Europe. Australia's distance from these markets is a big handicap, and there is a greater demand for the chilled commodity (which can be sent from Argentina) than for frozen meat. The long sea voyage thru the tropics has prevented, up to the present time, the export of chilled meat from Australia to Europe.

An improved European market for Australian frozen mutton since the war has led to the breeding, in some parts, of a sheep valuable for mutton, and yet possessed of a fair fleece. Thus we

[3] H. B. Smith, The Sheep and Wool Industry of Australia. Whitcombe & Tombs, Ltd., Melbourne. 1924

have crosses between the Merino and the Lincoln, and between the Merino and Leicester. A number of other English breeds including the Rommey Marsh, Shropshire, and Southdown have been introduced but unless present values are greatly changed, Australia is likely to retain the Merino as the chief basis of its flocks. Climate, distance from markets, and demand for good quality wool —all suggest that belief.

THE MEAT PACKING INDUSTRY

ESTHER EGAN
Chicago, Illinois

The packing industry is and always has been governed to a very great extent by geographical factors. Climate, drainage and nearness to a market have determined methods and location of plants, as well as prices to be paid for the finished product.

PRIMITIVE METHODS

Even in the days when primitive man hunted wild animals and prepared them for his own use, climate entered into the situation and determined his method. If his home were in a cold climate the meat was allowed to freeze and thus would keep all winter. In warmer, dry climates meat was dried in order to preserve it. In those days the packing business was a family affair, each man preparing the meat for his own family. This continued to be true even after domesticated animals were kept. Later on specialization began to appear in various lines of work, the ones who were most capable doing the work for a whole village; and thus we we have the beginning of the village meat market.

GEOGRAPHICAL FACTORS DETERMINE LOCATION

Here again geography enters the game. The man who was to kill and prepare meat for his village chose a site determined by the water supply and drainage, two very essential things in his business. These very things, years later, determined the location of the Chicago packing plants where they now stand, the river furnishing a natural drainage system while the lake yields an unlimited water supply.

EFFECTS OF REFRIGERATION

For years the industry remained a purely local affair, confined to a very small area because methods of preserving meat had not been perfected, transportation was poor, and refrigerator cars unknown. Only as methods of preserving were perfected and railroads made swift transportation possible and refrigerator cars solved the problem of transporting fresh meat, did the industry grow from the village shop to the greatest industry in the United States.

EARLY HISTORY OF THE PACKING INDUSTRY

The Connecticut Valley with its level, grassy lands was the first cattle-raising section in this country, and thus it happened that in the year 1662 Springfield became the first packing center of the land. Much of the meat packed here was sent to the West Indies. Cattle were driven into Boston and a regular market established there as early as 1633. When Faneuil Hall was erected in this city in the year 1742, cattle buyers and sellers met there and made regulations regarding the quality of the meat sold.

The Dutch in New York did a thriving cattle business, also sending meat to the West Indies. Pennsylvania, too, exported meat. Virginia raised many hogs which roamed the forests and fed on acorns, nuts, and peaches, and were very little care or expense to their owners. In the Carolinas the industry was much the same, and as the population moved southward Georgia was added to the list of cattle-raising states.

WESTWARD MOVEMENT OF INDUSTRY

As geologic forces had rendered the Connecticut Valley an excellent place for raising cattle, so they had also wrought a passageway from east to west thru the mountains by the Mohawk Valley. After the Revolutionary War the population of the New England States moved westward, many following the trail along the Mohawk River. The cattle industry followed the westward movement of the population, seeking always more room, for cattle-raising depended mainly upon the finding of new grass lands, and hogs lived chiefly on berries, nuts and roots. The pork from hogs raised upon these things was poor meat, soft and hard to keep. As the population moved southward along the Ohio River a new law prohibiting the making of whisky caused the corn to be fed to the cattle and hogs. This proved itself to be a blessing to the packing

industry by providing a much firmer, better quality of meat. When cattle and hogs were driven to market many died on the way, hence markets grew where water transportation was available. The Ohio River offered a cheap method of transportation, so cattle and hogs were floated down it to the Mississippi River and down this river to New Orleans. Missouri followed Ohio's example and floated its cattle down the Mississippi to market.

In the year 1818 Cincinnati was an important pork-packing center. Plants also sprang up at Alton, Illinois, and at St. Louis, Missouri. As the population moved westward, the packing industry followed. Kansas City, Omaha, and Sioux City were added to the list, and Chicago succeeded Cincinnati in importance.

Railroads reached out to the south and west. Texas cattle were driven to the nearest railway. They were bony, with little flesh and less fat, and, as they came from the range, made poor meat. They were therefore shipped into the corn belt to be fattened. Farther west the arid climate often resulted in a scant supply of grass and water, and when this occurred the cattle were sent into the corn belt for several months' feeding.

Before the Civil War, Kentucky was the center of livestock production, and Tennessee the center of the swine industry, while Altoona, Pennsylvania, was the center of the sheep raising business. From that time on the movement of these several industries was westward and northward. In 1869 receipts of live cattle in Chicago were 406,000 head while in New York they were 325,000 head.

Growth of Great Packing Centers

The packing industry of Chicago continued to grow in importance. Its central location on the edge of the corn belt with railroads reaching across this greatest of corn growing regions and others connecting it with eastern cities which offered a market for the finished product and its early start, aided the growth of meat packing. The first stock yards had been opened on the North Branch of the Chicago River for hogs only. In 1836 cattle yards were opened at Twenty-ninth Street and Cottage Grove Avenue. In 1865 the railroads combined to build the Union Stock Yards, which covered one hundred acres of land south of the city. The first shipment of meat consisted of 286 barrels of salted beef and 14 barrels of tallow. Today Chicago has the greatest meat packing plants in the world.

Omaha, Sioux City, Cedar Rapids and Ottumwa became centers of this industry because of the great number of hogs produced in Iowa. The location of these places eliminated the long trips to more distant plants and animals were in better condition when received. The city of Denver afforded the same opportunities.

REFRIGERATION REVOLUTIONIZES THE PACKING INDUSTRY

In 1879, ice packing, invented and made practical by a Scotchman named Dave Boyle, revolutionized the meat business. Previous to this time the seasons had controlled the industry. Packing had to be done almost entirely in the winter months. With ice it could be done in summer wherever cheap ice could be obtained. In this, Chicago, with an abundant supply, had another advantage.

Ten years later refrigerator cars were introduced but were not very successful, and this invention was not made practical until a new type of car was invented by Swift. The success of this method of transportation made it possible to send fresh meat anywhere in the country. Shortly after this, refrigeration solved the problem of ocean transportation. Fresh meat could now be sent where only dried or canned meat was sent before. The value of this invention to the packing industry cannot be estimated.

Fresh dressed beef leaves the packing house in refrigerator cars with close-fitting doors and insulated walls. At the end of the car are the ice bunkers reaching almost from floor to roof. These are filled from outside, the drainage passing out thru pipes in the floor. Cars are cooled before meat is placed in them.

Packers build and own their own refrigerator cars in order to have sufficient and proper equipment. Railroads pay six cents per mile for the use of these cars. "Peddler cars" are used to reach small towns in Kansas, Missouri, Kentucky, Iowa, Wisconsin, Michigan, Indiana, Ohio, Tennessee and Arkansas. This method makes possible the delivery of goods in smaller quantities than carloads. It is very simple. A car is loaded with orders which are dropped off at the different stations. These cars run on a schedule, reaching a certain town the same day each week. This method makes it possible for the market in a small town to receive fresh meat of the best quality at a reasonable price every week, and obviates the necessity of local butchering with its unsanitary methods.

The "peddler car" routes radiate from the large centers, often

covering 250 to 300 miles of territory. The consignments to various stations are unloaded by railroad employees. The Armour Company has an auto truck route that reaches 20,836 towns. Trucks are tightly closed and have insulated walls. Swift's car route system supplies 10,000 small towns with meat.

Refrigerator cars, owned and cared for by the packers, storage houses in consuming centers, fast trains and motor trucks enable the packers to get meat to the consumers in satisfactory condition and in the quickest possible time. Not only is the demand in the United States met, but about 600,500,000 pounds of meat are exported annually besides more than 789,000,000 pounds of lard per year.

Small plants have been found uneconomical and since refrigeration is possible most of the meat comes from large packing centers where transportation facilities enable firms to market easily the finished product, and where by-products can be utilized. The packers also handle butter, eggs or poultry because it can easily be done in their plants which have adequate refrigeration facilities.

INCREASE IN EXPORT TRADE

When first introduced, there was great opposition to the use of dressed beef, but nature aided the packers. In the winter of 1889-1890 the ice crop failed. Business in small places became too expensive and the butchers began to handle Chicago dressed meat. Customers were thus compelled to try it and found it good. England was very skeptical about it but was convinced in a year or so. In 1894 France bought of American packers cattle products to the value of $18,000,000. The geography of the packing industry had already expanded until it included Tokio, Osaka, Shanghai, Hongkong, Manila and Honolulu. Today, bacon, hams, lard and beef are imported into the United Kingdom from the United States; bacon and lard into Germany; bacon, lard and olio oils into the Netherlands, and beef into Norway, Labrador, Newfoundland, Belgium and Mexico.

Different countries demand different kinds of meat, as the preceding paragraph shows. The Englishman prefers lean meat, hence he demands an entirely different kind of bacon, and the American farmer must produce a certain type of hog for this trade if he hopes to compete with Denmark, Canada and Ireland. All three of these countries produce leaner meat than does the

United States because of different feeding conditions. Scandinavia, not being able to produce enough heavy meat, and needing it because of the cold climate, buys the heavy, fat pork. To Belgium and France go meats unmarketable in the United States.

LOCATION DETERMINES DEMAND

Even different parts of the United States vary greatly in the kinds of meats they demand. The varied and immense population of New York City uses all kinds of beef. The same is true of Jersey City. Both places also have a heavy Kosher trade which means that meat must be in the hands of the consumer within seventy-two hours after killing. This results in many live cattle being sent into New York City. A large part of Chicago's trade is also Kosher trade.

The Hudson Valley region and Washington take light beef, while Boston demands heavy beef. Minneapolis and St. Paul, altho so near each other, demand different kinds of meat, the former taking more "fed" cattle and paying higher prices. The large cities of Texas—Houston, Fort Worth, Dallas and El Paso —show an increasing demand for "fed" cattle. Cities having large foreign populations demand veal, which is much used by the Jewish and Slavic races.

Distributing centers have also been determined by their availability to the area of production and their facilities for distribution to markets, hence transportation facilities become an important factor. The two exceptions to this rule are Jersey City and New York City, which have large slaughtering plants of their own to meet the demand of their Jewish populations. All other large packing centers are in the area of production.

EFFECT OF SEASONS ON MEAT TRADE

Seasons influence production, marketing and prices of meat. Cattle in January have not been fed long enough to make ideal beef. February brings better meat, but March, April and May produce well finished beef. In July come grass-fattened cattle from Kansas and Oklahoma, and also yearling beef. August brings range cattle from the Southwest. September and November bring smaller numbers. Sheep also follow the seasonal movement. Lambs come in from April to September. The first lambs come from the warmer localities—first those from California,

Washington and Oregon, then those from the South Central States. Range lambs go to the feed lots of Colorado and Nebraska, and are marketed from November until May. Corn belt lambs come in December. Veal, too, is seasonal. Much of it comes from the dairy herds in order to save winter feeding and reach the market from January until June. Heavier calves come in from June until November. Corn determines when hogs shall go to market and also the price paid for them. When the supply of corn is low or prices are high the hogs are sent to market to avoid feeding them thru the winter. Receipts are usually lowest in September and high in December and January. Prices vary according to this seasonal marketing of hogs. This whole movement is controlled by the geographical factor of climate, and this movement determines prices.

There is a seasonal demand for certain meats. The surplus of beef and veal comes in autumn, from September to December. That of lamb and mutton comes in from July thru December. The pork surplus is from November to June, there being an increased demand for hams during the summer months, presumably because of the quantities of cold ham consumed during the warm weather.

There is also a seasonal movement of cattle, hogs, and sheep to the market, the farmer being influenced by certain factors to sell. A shortage of feed due to poor crops, or a desire to feed fewer cattle during the winter months, causes receipts of cattle to be greatest during September, October and November—the grass-fed cattle coming first, then the corn-fed cattle during the winter, and in early spring the cattle which have been fattening in the Corn Belt thru the winter, while May brings long fed cattle from the Corn Belt and grass cattle from the South. Here climate determines not only where cattle shall be raised but also when they shall be sent to market. Until refrigeration was employed climate also determined when meat should be sold and when eaten. Modern methods are interfering with the absolute power of climate and man is now dictating what shall be done with the results of his labor. The movement of hogs to market is also seasonal and much the same as that of cattle—the greatest number coming in during the months of November, December, January and February.

DISTRIBUTION OF LIVESTOCK AFFECTED BY CLIMATE

The distribution of livestock is determined primarily by the forage available and this is determined directly by climate and soil. For example, the Corn Belt produces more forage than any area of equal size in the world, due largely to the fact that the Great Glacier left this part of the country covered with a deep rich soil and to the fact that summer nights as well as days are warm. In 1919 this region had 20 per cent of the cattle and 41 per cent of the hogs in the United States. Forty per cent of the corn fed is fed to hogs and only 15 per cent to cattle. Even stalks, leaves and husks are chopped fine, preserved in silos and used as food for the animals. Much corn is thus saved from early frost.

Climate, in limiting the western Great Plains to a semi-arid condition, also limited the cattle industry. In the Southern States, Texas, Oklahoma and Kansas, the adaptability of sorghums to the climate has solved the problem of feed for cattle. They will grow where the climate is too dry for corn.

Irrigation in the arid West is becoming an important factor in the economical production of hogs. Alfalfa thrives in these sections and is an excellent food for hogs. They can be fed on it alone but the meat is better when hogs are fed as low as 2 per cent corn, barley or on low grade wheat or potatoes. Hogs are permitted to "hog off" fields, thus greatly reducing the labor of feeding them.

The climate of the Northwest, being moist and mild, affords a long season when fields may be used this way. "Hogging off" is also beneficial to the soil because the straw and stalks left by the hogs is plowed back into the ground and thus enriches it. Mild winters make it possible to let kale stay in fields all thru the winter months. In spite of these facts not enough hogs are raised to meet the demand and meat is shipped from east of the Rockies.

Kansas and Oklahoma have a climate sufficiently mild that expensive shelters are not necessary and they also have a long period of pasturage.

The United States ranks first in the production of swine and is said to produce the best pork in the world in the Corn Belt. The swine country is identical with this Belt which takes in Iowa, Illinois and part of Indiana and Ohio, and the eastern section of Kansas and Nebraska. The producton of corn is greater than that of Europe, Asia, Africa and South America combined. Corn

brings greater returns as pork than as grain so the Iowa farmer fattens hogs for market. Fifty per cent of the hogs are raised west of the Mississippi River, and many in Illinois, Indiana and Ohio, while 68 per cent of the pork is consumed east of the river and largely in the states of Massachusetts, New York, New Jersey, Delaware and Maryland.

PRODUCTION OF SHEEP

Good soil, level land and a desirable climate for grain have been against the sheep industry in sections where these three factors are present because the sheep cannot hold their own where wheat and corn, cattle and hogs can be raised. On the other hand, where the soil is rocky or poor, where the grass is short and the climate dry, the sheep thrive; hence we find Montana, Wyoming and Idaho leading sheep states with Texas first and California second. As in the case of cattle, sheep are fattened for market in the Corn Belt, in open yard feeding in the Southwest or in feeding barns in Northern States.

In 1923 Wyoming ranked first in wool production, with a total output of 21,200,000 pounds; Texas second, with 18,000,000 pounds; Idaho third, with 16,800,000 pounds.

The United States is at the foot of the list of principal sheep producing countries, having only twelve sheep to the square mile, and thirty-four sheep to each one hundred people, while Great Britain has 232 sheep to the square mile.

TRAVEL BOOKLETS AND THE TEACHING OF GEOGRAPHY

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Travel booklets provide the geography teacher with material that can not be obtained in other publications. No matter how many texts and reference books are on hand, the pictures and maps in travel booklets are different, often more attractive, and can be cut out and used in many ways.

FINDING UNUSUAL MATERIAL

All Atlantic, Pacific and round-the-world steamship lines and certain foreign railways have offices in the United States; their

advertisements appear in *Travel, Harper's* and other magazines. But there are many lines from Europe to Africa, Asia and Australia that are not so well-known in this country. They have excellent booklets which travelers have brought back, but it is difficult for the teacher to get them. They advertise in *The Illustrated London News, Graphic,* Paris Edition of the *New York Herald* and in *Cook's Tourist Gazette,* all of which may be ordered from Brentano's in New York; and in *Cook's Far Eastern Gazette* (Hong Kong) and *Cook's Oriental Gazette* (Colombo) which should be ordered direct. Many other foreign periodicals containing travel advertisements may be seen on the news-stands in any city.

ADDRESSES IN EGYPT

Some of the foreign companies advertising in a recent magazine from Egypt are:

1. Bibby S. S. Line, 10 Mincing Lane, London, E.C. 3 (London to India)
2. Nederland Royal Mail Line, Amsterdam (Amsterdam to East Indies)
3. Sitmar Line, Via Balbi, Genoa (Genoa to Egypt)
4. Cox and King's Shipping Agency, 13 Regent St., London, S.W. 1 (Winter in Egypt)
5. Lloyd Triestino S.S. Line, Trieste (London to Egypt and the Orient)
6. International Sleeping Car Co., 8 Sharia Manakh, Cairo (Holy Land and Egypt)
7. Farajallah and Company Tourist Agency, Box 246, Haifa, Palestine (Palestine, Syria, Egypt, and Sudan)
8. Messageries Maritimes, Marseilles, France (Marseilles to Yokohama)
9. V.M.L. Tourist Company, 76 Rue des Petits Champs, Paris
10. Orient S.S. Line, London (England to Australia)
11. Peninsular and Oriental S.S. Co., London (England to India and the Orient)
12. Servizi Marittimi, Naples (Italy to Egypt)

Addresses may be obtained from "Material on Geography which may be obtained free or at small cost" written by Mary J. Booth of the Eastern Illinois State Teachers College at Charleston. This excellent little book is out of print now, but it has gone thru several editions and it is hoped that another will soon be issued.* It should be in the hands of every geography teacher.

TOURIST AGENCIES

Two of the largest tourist agencies in the world are the American Express Company of New York, and Thomas Cook and Sons of London. Each has representatives in all civilized countries. A list of their offices is given on their letterheads, and nearly every

* Miss Booth now has a new edition completed. Announcement is made on page 365 of the *Journal.* Editor.

office publishes booklets describing tours in its own locality. It is better to write direct to such places as Jerusalem, Bombay, Cape Town and Sydney, than to try to get material direct from New York or London. Dean and Dawson of 500 Fifth Avenue, New York, is a tourist agency that has many offices in the United Kingdom and on the Continent.

Material from a World Tour

Some of the following material has been obtained by mail, while part has been gathered on two tours around the world:

In Armstrong's Tourist Agency, Church Street, Fort, Colombo, Ceylon, there are many travel booklets for free distribution, describing tours to Kandy, Mount Lavinia, Anuradhapura, Nuwara Eliya and elsewhere in that beautiful island. Few of them can be obtained outside of Ceylon, and the management would doubtless send copies if postage were sent in advance.

From the Sociedad de Atraccion de Forasteros, Rambla del Centro 30, Barcelona, Spain, one may get several booklets describing Barcelona and Montserrat. There are excellent pictures and a map of the city.

Among other tourist agencies that would probably forward booklets if postage were sent are: Bureau Officiel de Renseignements, 30 Hooge Nieuwstraat, The Hague; Cesaraon's Tourist Office, Via Vittoria Veneto (near Piazza Barberini), Rome; International Travel and Tourist Agency, Via de Medici 6, Florence; Nasti's Tourist Agency, Naples. Signor Nasti is very kind to travelers, and has a large stock of information about Pompeii and Vesuvius.

"Off the Beaten Track" is the title of a series of about a dozen booklets published by the Continental Department, Southern Railway, Victoria Station, London S.W.I., describing tours that begin on that line and end in Switzerland, France, Germany, and Holland. Each booklet describes one tour, and there are numerous maps and illustrations.

The Chinese Government Railways of Peking have a number of interesting booklets, including one well-bound book "China" of 106 pages. These are printed in China, and are so different from those made in America as to arouse the pupils' curiosity. The following companies also have booklets about China: China Navigation Co., Butterfield and Swire, Agents, Hong Kong; Java-China-Japan Lijn, York Building, Hong Kong.

From the Official Tourist Bureau, Noordwijk 36, Weltevreden, Batavia, Java, has come a bundle of six or eight booklets, well illustrated and written in English, describing things not found in ordinary texts. They tell of Patoeha, Tropical Holland, The Padang Highlands, Batavia, Bandoeng, Through Sumatra from Medan to Padang and of other places.

There are several very fine maps of the Dutch East Indies, and one booklet entitled "Wayang Wong" contains seven beautiful pictures of the native dance in honor of the Javanese god "Wayang," the fantastic creature that is shown on so many pieces of Javanese batik.

INDIAN BOOKLETS DE LUXE

The Great India Peninsula Railway of Bombay has published a series of booklets by St. Nihal Singh that are profusely illustrated with rotogravure pictures. "The Road to India's Past," "India: New and Old" and "India Beckons" have many pictures of Indian sculpture, temples and ruins. "The Monuments of Sanchi" by Sir John Marshall, Director-General of Archæology, "The Call of Ellora" and "Eastward Ho," with the three booklets by St. Nihal Singh, contain 138 pictures, some 15 inches wide. This is one of the best series of advertising that has been published and would cost many dollars if bought in book form. Half a dollar sent for postage is a trifling amount to pay for such a large number of beautiful pictures. Other Indian lines that have issued attractive pamphlets are the East Indian Railway and the Bangal and Nagpur Railway, both of Calcutta.

Wilkins and Biehl of Houston, Texas, are agents for several German steamship lines that sail from Gulf ports to the Caribbean and Germany. They have attractive booklets about the Rhine that are different from those issued by the North Atlantic German shipping companies.

The Hugo Stinnes Linien of Hamburg, the Hamburg-Amerika Linien of Hamburg and the Norddeutscher Lloyd of Bremen all have booklets containing pictures of places between Germany and the Far East.

W. F. Stevenson and Co., Ltd., Hogar Filipino Bldg., Manila, P.I., are agents for the Straits S. S. Company whose steamers run between Zamboanga, P.I., and Singapore via British North Borneo. The Australian-Oriental Line, Ltd., 503 Calle Echague, Manila, P.I., has passenger service between Hong Kong and Australia. These companies have illustrated advertising literature.

The Compania Trasatlantica de Barcelona, Plaza del Duque de Medinaceli 8, Barcelona, Spain, has folders about its services to West Africa, Brazil-Plata, Venezuela-Columbia, Cuba-Mexico, New York and the Philippines.

From time to time the Tourist Development Association of Cairo, Egypt, publishes "The Valley of the Nile," a magazine devoted to travel in Egypt. The latest copy of 64 pages contains 19 illustrated articles and covers nearly every activity in Egypt and the Sudan. There is one full-page colored picture of the temples of Karnak, one full-page picture of King Fuad, and there are many excellent pictures in the advertisements.

In the January, 1927 issue of "L'Echo des Touristes," a monthly magazine published by the Lubin Agency, 36 Boulevard Haussman, Paris, there are some very unusual pictures of native life in West Africa, to which country the Agency conducts a tour each summer. Further particulars and pamphlets regarding the tour are distributed by the Agency, which sometimes sends a free copy of "L'Echo" on request.

The American Chamber of Commerce, Calle Pinpin, Manila, P.I., is anxious that all Americans should be well-informed about our distant island possessions. The Secretary gave me an assortment of booklets, including "Manila and the Philippines," "Baguio. The Mountain Resort of the Philippines," "The Manila Carnival," "The Philippine Problem," and "Miss Philippines is Calling You." There are pictures of Manila, Los Baños and Baguio, with descriptions of native life in the lowlands and in the mountains.

THE FAR EAST

In my files are numerous booklets issued by the Hong Kong, Canton and Macao Steamboat Company of Hong Kong, the Imperial Railways of Japan, Tokyo, and the Chosen Railways, Ryuzan, Chosen (Korea). Tho there have been wars and earthquakes in years gone by, these companies have always had booklets for distribution, and doubtless they have them now. Most Japanese travel booklets have especially good maps, all have pictures, and some are printed on Japanese paper so thin that it is printed on only one side. They are in English. Every hotel lobby in the Orient has a plentiful supply, and new booklets are frequently issued. The Japanese are good advertisers and are not stingy about sending literature to the United States.

ORDER EARLY

Naturally it takes much longer to get travel booklets from far distant places than from New York or Chicago. For all places on the coast or railway (having "steam-served" postoffices) between Port Said and Yokohama, from two to four months are necessary to get replies. For inland places such as Kashgar in Turkestan, Teheran in Persia, Srinagar in Kashmir or Addis Ababa in Abyssinia add one month more. From the latter places come no free travel booklets, but American or British consuls live there, who will give information in answer to specific inquiries.

USES FOR TRAVEL BOOKLETS

The booklets may be used in the condition in which they arrive. They may be taken apart by removing the staples, and the pictures and maps trimmed to a useful size. Pictures may be put into scrapbooks, mounted on heavy paper and hung on the wall, or pasted on sheets of black construction paper for use in a projecting lantern. For the latter it is often desirable to color them. Trim the picture to a size somewhat smaller than the opening in the lantern, soak in water, lay it on glass, absorb surplus water with clean blotters, and then apply transparent water colors, using blotters frequently and applying more color as desired. Tinting should be brighter than might be expected, as not all the color seems to be reflected to the screen.

The timetables that come in the package of travel literature are useful in planning imaginary journeys. Pictures of people show how to make costumes for pageants and plays. Some of the pictures may be used in art classes, since they show unusual color and design. Ideas for work in making models in papier mache, clay, cardboard, putty, bamboo and wood are obtained from pictures of foreign houses, bridges, rivers, cliffs, beaches, volcanos, lakes and temples.

Travel talks by the teacher can easily be worked up from travel booklets, while talks by pupils on foreign people, industries, customs, dress, history, and religions may derive much of their information and inspiration from material obtained from American companies or directly from abroad.

ENDLESS CHAIN OF ADDRESSES

New booklets bring new advertisements, and the gathering of this kind of geographical material is like an endless chain. A geographical library is gradually built up which can not be duplicated, and the only limit to its size is the amount of time and money which the teacher wishes to spend.

TESTING IN COMMERCIAL GEOGRAPHY

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At the present time a considerable proportion of the teaching profession is aroused over the unsatisfactory status of methods of testing and with open mind is sincerely trying to find a remedy for past evils and defects. Many books have been written proving beyond doubt that great evils exist in the essay type of test. The reader is referred to these publications for the experimental evidence which proves the existence of these conditions since such proof is not in the compass of this discussion.

In most activities the human mind tends to a fixed way of doing things because of one or more of the following reasons: (1) by conscious effort the individual has determined what he considers the best way to do a given piece of work; (2) tradition is so firmly rooted that it is impossible or at least undesirable to change an established habit; (3) no conscious attention has ever been given the matter, that is, the individual blindly and unquestioningly imitates another. Probably in no phase of education has this situation been more true than in the matter of testing. Most teachers have followed tradition or have been imitators. Few have consciously attempted to determine whether their method is the best or if it is fair and just.

NATURE OF THE SUBJECT TO BE TESTED

Various writers have shown by experiment that the subjective factor has been a large element in scoring examination papers and in giving marks based wholly or in part upon such papers. This has been true even in mathematics where one would suppose accurate measure of achievement would be easy. Instances have been cited where marks of mathematics teachers for the same paper

have ranged from 28 per cent to 92 per cent.[1] One would suppose that such conditions would be equally bad or even worse in such subjects as history and geography. However, surprising as it may seem, some experiments would tend to show that conditions in these subjects are less bad than in mathematics. Nevertheless, in these fields where content is broad and difficult to delimit and where verification in many cases is difficult, testing conditions undoubtedly are bad.

Commercial geography has not always been well taught in high schools. The field is broad and its limits have been difficult to determine. The subject is now fairly well delimited and a number of good texts are available. A well written and abundant body of literature is also obtainable. However, testing of achievement by objective tests has been given little attention in high school geography to date. Objective and practice tests for grade geography are available and point the way for a similar work in high school geography.

THE PURPOSE OF TESTING IN GEOGRAPHY

Every teacher should make a frequent analysis of each piece of teaching activity by asking himself, what is the specific purpose of a given piece of work? This self-analysis should compel the teacher to have a clear and definite aim for each piece of work and will tend to eliminate worthless activities. If this question is applied to testing in high school geography the answer in most cases will probably be, that the purpose of the test is to measure achievement. Dr. Ruch says, "Measurement has generally been the most conscious aim."[2] In some instances, as in learning typewriting, the test measures improvement but this has not become, as yet, a factor in testing in geography. The test also affords the teacher a means of measuring the success of his work and points out defects. In addition, the test furnishes a certain amount of motivation to the pupil. In short tests on the advance assignment, motivation may be the chief function of the test. Training in written expression is considered by some as an important aim of testing. However, these latter values and other similar values ascribed to tests are in the nature of by-products rather than the chief aim in testing. The primary purpose of most testing in geo-

[1] Daniel Starch, Educational Psychology, p. 434. Macmillan Co. 1919

[2] G. M. Ruch, Improvement of the Written Examination, p. 4. Scott, Foresman and Co. 1924

graphy is to determine what the pupil knows about a given unit of work, in short, to measure achievement.

TYPE OF TEST TO BE USED

In determining the type of test to be used it must be kept clearly in mind that the purpose of the test is to find out what the pupil *knows* about the subject; not what the teacher *thinks* he knows or what the teacher *hopes* he knows. It should not be to determine how much the pupil has worked nor how much he already knew before pursuing the subject. Because of inherent ability or because a pupil has had previous knowledge of a subject he may not have worked as much as some other member of the class who with less ability and knowledge has struggled to make the grade. The bright pupil must not be penalized because of his ability and knowledge. This means that the test must be objective and not subjective. It must be such that the prejudice of the teacher, questions of conduct and discipline, health, industry, humor, etc., do not enter into consideration. If the teacher insists on injecting sentiment or similar considerations into markings he may give objective tests first. Then he may adjust grades to suit himself. But he will then know what percentage of the grade is earned and what percentage is the result of subjective considerations. If the test is to measure achievement then all the other items so commonly entering into the measurement must be eliminated.

EXAMPLE OF A HIGH SCHOOL GEOGRAPHY TEST

The following is submitted as a specimen of an objective test. Three types of questions are used, namely, true-false, completion, and multiple choice. Other types may be included in a test if it seems desirable or any one type may be used to make up the complete test. Later tests may be given involving other types of questions. A number of books have been published emphasizing the various types of tests. It is thought unnecessary to enter into a discussion of them here since the various types with a discussion of the good and bad points of each is easily obtainable elsewhere.

This test was given to a class of twenty-three high school students of the tenth grade. The test covers the work completed in a half semester's work in Commercial Geography. The following topics had been studied and furnished a basis for the test: cereals,

animal industries, fruits and vegetables, and fibers. The class was given forty minutes to write the test and all students completed it in that time.

SPECIMEN TEST

Some of the following statements are true and some are false. If the statement is true, place a "T" in the margin at the left; if it is false, place an "F" in the margin.

1. Rye is a more important crop in the United States than wheat.
2. Oats are a more profitable crop in Illinois and Iowa, than corn.
3. Oats require more moisture for growth than wheat does.
4. Corn is the most valuable cereal crop in the United States.
5. The Mediterranean type of climate is well suited for the production of corn.
6. Over half the rice grown in Louisiana is grown without the aid of irrigation.
7. Cuba is the greatest sugar exporting country in the world.
8. Our most important cotton manufacturing centers are east of the Appalachian Mountains.
9. Tobacco has a much wider climatic range than either beets or sugar cane.
10. Soil is the limiting factor in the production of sugar cane in the United States.
11. Rye is used more extensively for human food in Europe than it is in the United States.
12. Twenty-five inches of rainfall is the maximum amount required for the production of rice without irrigation.
13. The horse is used more in the important agricultural regions of the world than any other beast of burden.
14. The annual return from poultry in the United States is greater than the value of gold mined in this country annually.
15. Most of the beef cattle are pasture-fattened in the British Isles.
16. British beef cattle are raised largely for home consumption.
17. The geographic distribution of beef cattle in the United States depends chiefly upon the demand for beef.
18. There is a high density of beef cattle in the spring wheat district of the United States.
19. With an increase in density of population the number of dairy cattle increases and the number of beef cattle decreases.
20. The character of the dairy industry in any region is determined to a large extent by accessibility to markets.
21. The swine industry of Germany is important for the same reasons it is in the United States.
22. Sheep are used for dairy animals in Italy.
23. Truck farming is carried on mainly in the vicinity of large cities.
24. The value of the potato as a food crop lies largely in its high yield per acre.
25. Soy beans are used as a fertilizer in the cotton belt.
26. Orchard fruits grow in tropical and sub-tropical countries.
27. The foreign trade in potatoes is large.
28. The climate of the southern and eastern sides of Lake Erie is not conducive to the production of orchard fruits.
29. Cotton and cotton goods form one of the principal groups of commodities of trade.
30. Cotton is grown in the tropics and in the warmer parts of the temperate zones.

31. Flax for linen is grown extensively in the United States.
32. Liverpool is the greatest cotton importing port in the world.
33. Manila hemp is a fiber made from a relative of the banana palm.
34. Flax plants grown for fiber are pulled before the seed matures.
35. The spring wheat belt in the Red River Valley of the North is important for the production of flax for seed.
36. Beef production responds more quickly to changing conditions than pork production does.
37. The United States imports large quantities of Egyptian cotton.

Fill the blanks in the following sentences with the correct word:

38. Production of sugar cane in the United States is limited by ————.
39. The city that ranks first in meat packing is ————.
40. The country having the greatest number of cattle is ————.
41. The most important dairying state in the United States is ————.
42. The most important wheat center of the world is ————.
43. The most important state for the production of dairy products is ————.
44. Most of the live cattle shipped from the United States go to ————.
45. The geographic distribution of swine in the United States is determined primarily by the distribution of ————.
46. The chief economic use of the goat in Switzerland is for ————.
47. The packing industry received great impetus by the invention of the ————.
48. The best variety of cotton grown is ————.
49-51. Practically all the citrus fruits in the United States are grown in the following states: ————, ————, ————.
52. Most of the American grown lemons come from ————.
53. Ninety per cent of all the English walnuts grown in the United States are grown in ————.
54. The greatest commercial crop of the United States is ————.
55. The worst enemy of the cotton plant is the ————.
56-59. Four varieties of cotton are: ————, ————, ————, ————.
60. The leading cotton producing state in the United States is ————.
61. The chief use of American hemp is for the making of ————.
62. Manila hemp is grown chiefly in ————.
63. Most of our binder twine is made from ————.
64. The cotton industry was revolutionized by the invention of the ————.

Underscore the correct word of the series in the following statements.

65. Germany, Hungary, Russia, Ireland is the leading country for the production of potatoes.
66. Eighty per cent of the world's flax fiber is grown in Russia, Ireland, Belgium.
67. Kentucky, Michigan, Wisconsin, Indiana is the chief hemp producing state.
68. Jute is grown most extensively in Yucatan, Ganges Basin, Ecuador.
69. In New Zealand sheep are raised primarily for their wool, mutton, milk.
70. Argentina, India, Austria, United States ranks first in the production of sheep.
71. The pig, horse, cow, sheep is the most important animal in the Mediterranean region.
72. Butter, milk, cheese is the most important product of the dairy industry in the United States.

73. The number of cattle per capita in the United States has decreased, increased, since 1900.

74. Russia, United States, Argentina, British India leads the world in wheat production.

75. Chicago, Buenos Aires, Minneapolis, London is the most important flour milling city in the world.

SCORING AND GRADING

The papers were not marked on the percentage basis with 100 per cent a perfect score. There are 75 elements in the test and one point was deducted for each error. The grades for the class were obtained by arranging the scores for the various papers according to the Normal Frequency Curve of Distribution. Following is the distribution of the scores, ranging from 36 to 70:

		45		
		47		
		48		
		48		
		48		
		52		
		52		
		55		
		55		
	40	55	60	
	42	55	62	
	43	56	63	
36	43	56	67	70
E	D	C	B	A

The median score is thus found to be 52. According to this scheme of grading, 3 to 7 per cent should receive the highest grade or "A" and the same percentage the lowest grade of "E"; about 20 per cent should receive "B" and 20 per cent "D," and approximately 50 per cent should receive "C." This results in one pupil who scored 70 receiving "A" and one who scored 36 receiving "E." It is for the teacher to determine if those receiving "E" should fail. The scores from 60 to 67 inclusive receive "B" and those from 40 to 43 inclusive receive "D." The remainder of the scores ranging from 45 to 56 receive "C."

No attempt is made here to justify the use of the Normal Frequency Curve in marking. A large body of literature is available on the subject and the reader is referred to it. The teacher must use discretion in marking by it. It cannot always be applied rigidly, especially in small groups. It should be regarded as a

standard and as a norm and not as a system to be followed slavishly. After using it with objective tests for a number of years the writer is better satisfied with it than with any other method of testing and marking. A striking statement justifying its use is this, "The normal distribution curve has killed its hundreds, but the haphazard mark of the untrained teacher has killed its thousands."[3] Dr. Ruch summarizes the essential idea back of its use as follows: "A pupil can fairly be said to have been measured when he has been correctly spaced along a scale of merit in such a way that his relative achievement with respect to other members of the group has been reliably portrayed."[4]

OTHER CONSIDERATIONS

In-so-far as the teacher's time is concerned, not much is gained or lost. Such a set of 75 questions as given in this test cannot be prepared and mimeographed in less than two or three hours. About the same amount of time is required for grading a set of papers using the essay test. However, there is no reason why a set of questions such as this cannot be used again for future classes if the teacher is careful that copies do not get abroad in the school. At any rate the same test may be repeated with safety every two or three years. The teacher will thus gradually accumulate sets of such questions and will not need to put in so much time in their preparation after the first year or two. Thus in the end there will be an economy of time for the teacher.

Some argue that such a test measures factual information only. In order to determine the truth or falsity of many of the questions in this test a process of reasoning and logic must be pursued. The whole situation must be analyzed before a conclusion can be reached. Also, it should be remembered that reasoning is possible only when there is a rich background of knowledge upon which to base it. The measure of information in most cases will be a fairly good measure of the ability to use such information, providing the knowledge has been obtained by problem solving or other methods requiring purposeful thinking.

[3] Editorial, *Wisconsin Journal of Education*, October, 1926, p. 68

[4] Ruch, op. cit., p. 37

TENTATIVE PROGRAM

NATIONAL COUNCIL OF GEOGRAPHY TEACHERS

Social-Religious Building at George Peabody College for Teachers

Tuesday, December 27, 9:00 A.M.

1. A Year's Course in Geography for Normal Schools and Teachers' Colleges.
   DE FOREST STULL, *Associate Professor of Geography,*
   Teachers' College, Columbia University
2. The Organization of a Department of Geography in a Teachers' College.
   WILLIAM C. GOULD, *Professor of Geography,*
   Northern Illinois State Teachers' College, De Kalb
3. Professionalizing Geography for Teacher Training.
   MISS SELMA ABRAMS, *Instructor in Geography,*
   New Orleans Normal School, New Orleans
4. Method Courses in Geography, Content, Scope, Aim.
   a. MISS FLOY ROBBINS, *Instructor in Geography,*
      Murray State Normal and Teachers' College, Murray, Kentucky
   b. MISS WILMA BOLTON, *Instructor in Geography,*
      State Teachers' College, Hattiesburg, Mississippi
5. Local and State Geography as Requirements for the Average Grade Teacher.
   MISS DARTHULA WALKER, *Instructor in Geography,*
   West Texas State Teachers' College, Canyon

Tuesday, December 27, 1:30 P.M.

1. Imparting the Philosophy of Geography to Teachers.
   EARL E. LACKEY, *Associate Professor of Geography,*
   University of Nebraska, Lincoln
2. Whom Shall We Encourage to Become Geography Teachers?
   DR. COLLIER COBB, *Head, Department of Geology,*
   University of North Carolina, Chapel Hill
3. Placement of the Geography Teacher.
   DR. CLYDE E. COOPER, *Professor of Geography,*
   Ohio University, Athens
4. A Project in the Use of the Motion Picture in Geography.
   MISS ERNA GRASSMUCK, *Professor of Geography,*
   State Teachers' College, Indiana, Pennsylvania
5. Systematized Pronunciation of Geography Place Names.
   MARK E. JEFFERSON, *Professor of Geography,*
   Michigan Normal College, Ypsilanti
6. A Development of Laboratory Work in Geography in a Teachers' College.
   FRANK H. COLYER, *Professor of Geography,*
   Southern Illinois State Normal University, Carbondale
7. Announcement of Committees.

Tuesday, December 27, 6:00 P.M.

1. Annual Dinner of the National Council of Geography Teachers.
   Cafeteria, George Peabody College
2. Presidential Address: A Use of Field Work in Training of Geography Teachers.
   DR. ROBERT G. BUZZARD, *Professor of Geography,*
   Illinois State Normal University, Normal

3. Around the World with the S. S. *Ryndam.*
   DR. DOUGLAS C. RIDGLEY, *Associate Professor of Geography,*
   Clark University
4. Educational Values of Field Work for Beginning the College Year in Geography.
   DR. WALLACE W. ATWOOD, *President, and Director of the Graduate School of Geography,*
   Clark University

Wednesday, December 28, 9:00 A.M.

Industrial Arts Building, Room 201

1. The Principle of the Type Study.
   DR. CHARLES MCMURRY, *Professor of Elementary Education,*
   George Peabody College for Teachers, Nashville
2. Developing a Technique in Training Pupils to Study.
   MRS. MARIE C. GRAHAM, *Training School,*
   State Teachers' College, Indiana, Pennsylvania
3. Teaching a Big Unit: The North Central States.
   MISS MAY PITTS, *Demonstration Teacher, Fifth Grade,*
   Peabody Demonstration School, Nashville
4. The Use of Composite Maps in Teaching Geography.
   BERNARD H. SHOCKEL, *Professor of Geography,*
   Indiana State Normal School, Terre Haute
5. *Report of the National Council Meeting at Seattle.
   MISS ERNA GRASSMUCK, *Professor of Geography,*
   State Teachers' College, Indiana, Pennsylvania
6. Report of the National Council Meeting at Toronto.
   MISS LOUISE E. MEARS, *Professor of Geography,*
   State Teachers' College, Milwaukee, Wisconsin.
7. Announcements

GEOGRAPHICAL PUBLICATIONS

Mary Josephine Booth. **Materials on Geography.** 101 pp. Address, Miss Mary Josephine Booth, State Teachers College, Charleston, Ill. 1927.

Materials on Geography is the fourth revised edition of this extremely valuable contribution to geography teaching by Miss Booth. The publication lists hundreds of excellent reference materials. The publications listed are the type that may be obtained free or at small cost. They are usually issued as well illustrated pamphlets and come from many sources such as the U. S. Government, various state governments, foreign governments, tourist bureaus, railway and steamship lines, manufacturing firms, chambers of commerce of cities, of states, and of countries. The list covers such subjects as general geography, commercial products, industries, transportation, educational exhibits, visual instruction, such as moving picture films, lantern slides, photographs, post cards, stereographs, etc. It also includes a list of firms who handle geographical material. The list is so thoroly well organized and clear-cut that there will be little difficulty in finding material on almost any geographic subject that the teacher is likely to need. This little publication should be in the hands of every teacher. At least every school should make a selection of material and get it for their school use. All orders for this publication should be sent directly to Miss Booth as she has undertaken to make this contribution to education at a small charge of fifty cents.

Carl Ortwin Sauer. **The Geography of the Pennyroyal.** 303 pp., 125 maps and photos. The Kentucky Geological Survey, Frankfort, Ky. 1927.

Darrell Haug Davis. **Geography of the Blue Grass Region.** 215 pp., 7 maps, 56 photos. The Kentucky Geological Survey, Frankfort, Ky. 1927.

The appearance of the two volumes named above complete the series of regional geographical studies covering Kentucky.

To date this is the first complete study of the regional geography of an entire state, and the Geological Survey and authors of the studies are to be congratulated upon their success as pioneers in a field of work still largely virgin. Perhaps the greatest value of the reports to geographers lies in the suggestions as to methods used in attacking such a problem, and the scheme of presentation of the results.

The two volumes under review cover with only a slight interruption a broad belt running northeast-southwest across the state. The region is predominantly agricultural, and the character of the land, its agricultural possibilities and utilization occupy the major part of both volumes. The northeastern portion known as "The Blue Grass" is popularly pictured as a country of rolling meadows of luscious grass upon which are pastured pure bred trotting horses. For the Blue Grass as a whole, this picture, we are told, requires considerable modification. It describes fairly accurately only the limited area known as the "Inner Blue Grass"—the average number of horses and mules per square mile for the Blue Grass as a whole being less than in the state of Iowa or Illinois. However, the Blue Grass because of its high productivity is "in fact as well as in popular fancy, 'the Heart of Kentucky.'"

Both volumes are profusely illustrated with excellent photographs, maps and diagrams. In general the illustrative material is well chosen and is woven into the textual material where it belongs—not tacked on at the end as an appendage or scattered about

promiscuously with an eye purely for its decorative effect. Of particular interest in the Pennyroyal report is the series of large scale maps showing the conditions of the physical environment and the utilization of the land in typical sections of the various sub-regions. The make-up of the publications reflects much credit upon the Geological Survey.

The volumes bear all the earmarks of careful scholarship, an intimate familiarity with the region and a judicious analysis of the various factors involved. The authors have not hesitated to point out maladjustments or lack of proper co-ordination between political and economic facts. Thus the state's attitude toward taxation of forest land and the small size of the political units in the Blue Grass are pointed out as conditions which need remedying.

The volumes deserve a place in the library of every geography student who is interested in the general problem of geographic field work. The other four volumes of the series are:

Vol. 9 Geography of the Jackson Purchase, D. H. Davis, 1923
Vol. 18 Geography of the Mountains of Kentucky, D. H. Davis, 1923
Vol. 19 Geography of the Kentucky Knobs, W. G. Burroughs, 1926
Vol. 24 Geography of the Western Coal Fields, W. G. Burroughs, 1925

W. O. BLANCHARD

University of Illinois

Franklin Thomas. **The Environmental Basis of Society.** 336 pp., one photo (that of Karl Ritter), bibliography. The Century Co., N.Y. 1925.

Huntington and Whitney. **Builders of America.** 370 pp. Wm. Morrow Co., N.Y. 1927. $3.50.

Vaughen Cornish. **The Great Capitals, An Historical Geography.** 296 pp. Metheum & Co., London. 1923. $2.75.

1. This book, by an extension lecturer in sociology at Columbia University, affords an excellent summary of the history of the appreciation of geographical influences. It consists largely of excerpts and critical summaries of the views of about 170 well selected writers on the influence upon man of climatic conditions, natural resources, accessibility, scenery, etc. The views are arranged by topics and historically. For example, climatic influences, which occupy nearly one-third of the book are considered under "Ancient and Medieval Theories," "Early Modern Theories" and "Late Modern and Contemporary Theories."

This book is a history of that phase of geography which deals with environmental influences. It therefore is a very valuable supplement to Keltie's "History of Geography," which treats chiefly of exploration. All teachers of geography could read it with enjoyment and profit. It should be in every normal school and college library and in many high school libraries.

2. Persons interested in the geography of the United States are concerned with the character of the population, regional contrasts in types and also in the conditions making the people what they are. This book, by Ellsworth Huntington of Yale and Leon Whitney, secretary of the American Eugenics Society, contributes much light to these topics. It can be read rapidly with pleasure and profit by all geography teachers.

3. This is a scholarly account of geographic conditions affecting the chief capitals of the world from the earliest historical times to the present. It contains much of interest and value to geography teachers. Even school children can enjoy and profit by the sections on the present capitals.

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2. **For persons residing outside of the regions of reduced rates.** Purchase a round-trip ticket to nearest station issuing thru tickets to Nashville and lying within the region of reduced rates. At that station purchase a one-way ticket to Nashville and *secure a certificate* as directed in the preceding paragraph.

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Ticket agents at Nashville will honor any endorsed and validated certificate. They will sell to you a continuous passage, one-way, return ticket for one-half the regular fare, by the same route as that followed on the trip to Nashville. The last date on which certificates may be validated is December 31. The last date on which return tickets may be purchased is January 4.

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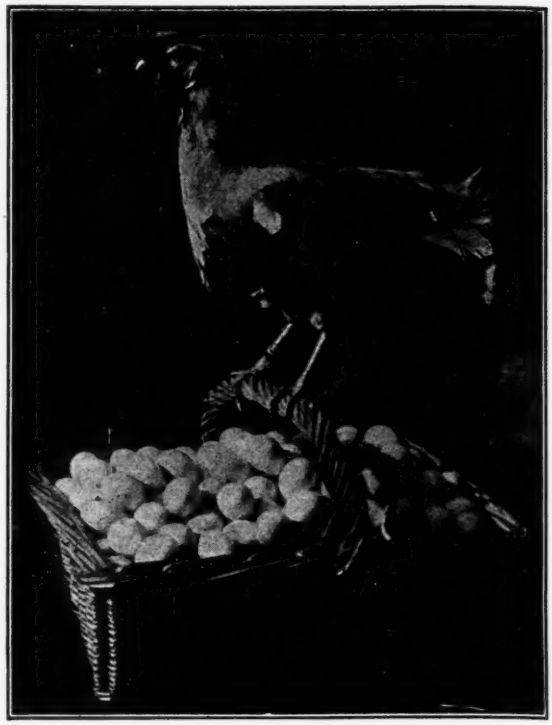

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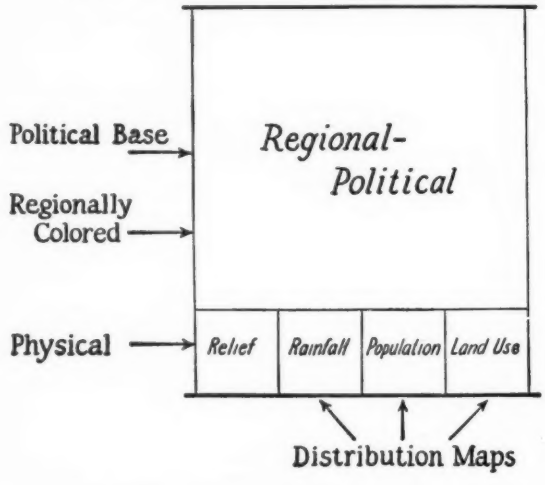

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Dr. Brigham cites the factors and causes that have contributed to the development of an American nationality. Those who profess to have this feeling of nationality can best further its development through the power of their character and clean living.

Herbert H. Gowen. **Asia, A Short History.** 436 pp. Illustrated. Little-Brown and Company, Boston. 1926. $3.50.

The story of the leading movements of Asia together with the great personalities back of them are traced from earliest times. Frequent references are made to contemporary incidents of American and European history. The author believes that an understanding of the social and political background of the Asiatics will help prepare America for the part it must take in the era of the Pacific.

Cameron Morrison. **A Junior Geography of India, Burma and Ceylon.** Second Edition. 159 pp. Illustrated. Thomas Nelson and Sons, Ltd., London. 1926.

Two chapters describing a voyage around the coasts have been added in the revision of this text. Much of the work is based on the interpretation of the maps which are of the same high character as those of the Imperial Gazetteer of India.

Nellie B. Allen and Edward K. Robinson. **Stories of our Earth.** 31 pp. Ginn & Co., Boston. 1927. 36 cents.

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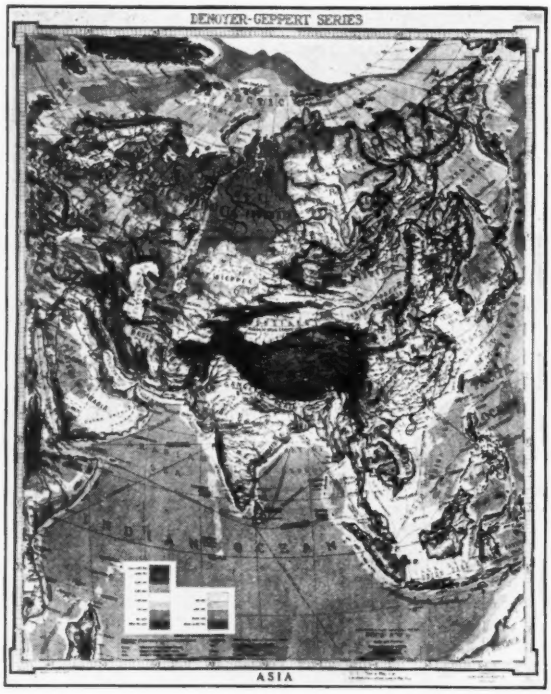

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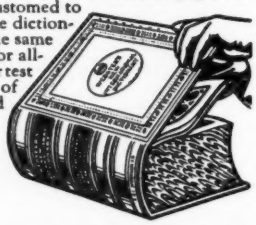

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Charles R. Toothaker. **Commercial Raw Materials.** Revised Edition. 308 pp. Illustrated. Ginn and Co., Boston. 1927. $2.00.

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I. G. Davis and C. I. Hendrickson. **Soil Type as a Factor in Farm Economy. I. The Town of Lebanon.** Bulletin 139, 95 pp. Storrs Agricultural Experiment Station, Storrs, Conn. 1926

This Bulletin summarizes the relationship found in Lebanon between soil types and land utilization. Crop and milk yields, farm organization, and labor incomes were examined relative to these soils with the hope of setting up a partial basis for judging farm valuations and tax levies, subject, of course, to modifications imposed by relations to markets and transportation facilities.

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